REMARKS

Claims 1-95 are now pending in the application. Claim 9 is cancelled herein. Claims 1, 17, 35, 47, 61 and 73 are amended herein. New Claim 96 is presented herein. Claims 92-94 are amended herein.

While Applicants disagree with the current rejections, Applicants have amended the claims to expedite prosecution. Applicants reserve the right to pursue the claims as originally filed in one or more continuing applications. Support for the amendments to the claims can be found throughout the drawings and specification. As such, no new matter is added. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

Applicants would like to thank the Examiner for courtesy extended during the interview on June 11, 2008. During the interview, the Examiner appeared to agree that the relied upon references failed to disclose joint decoding of a signal that is encoded based on a space time block code and an outer code. For at least this reason, independent Claims 1, 17, 35, 47, 61 and 73 as amended herein distinguish over the prior art of record subject to further consideration and/or search.

Decoding generally refers to the conversion of an encoded sequence to an original sequence thus reversing the affects of the encoding process. Joint decoding refers to the conversion of an inner and outer encoded symbol sequence to an original sequence reversing the affects of both the inner and outer encoding processes during the same time period. In one aspect, joint decoding reverses the affects of a first encoding process that is based on an inner code while reversing the affects of a second encoding process that is based on an outer code.

CLAIM OBJECTIONS

Claims 61-72 and 92-94 stand objected to for certain informalities. Claim 61 is amended to remove the term "decoded". Claims 92-94 are amended according to the Examiner's suggestions. Therefore, reconsideration and withdrawal of these objections are respectfully requested.

DOUBLE PATENTING

Claim 9 is objected to as allegedly being a substantial duplicate of claim 8. Claim 9 is cancelled herein. Reconsideration and withdrawal of this objection is respectfully requested.

Claims 1, 17, 35, 47, 61, and 73 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Pat. No. 7,133,473. This rejection is respectfully traversed. A terminal disclaimer is submitted herewith as suggested by the Examiner. Reconsideration and withdrawal of this rejection are requested.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-3, 10-13, 17-21, 26-31, 35-37, 40-43, 47-52, 54-57, 61-63, 66-69, 73-76, 79-82, and 89-91 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Onggosanusi (U.S. Pub. No. 2002/0196842) in view of Fang et al. (U.S. Pat. No. 5,757,834).

With respect to Claim 1, Onggosanusi and Fang do not at least show, teach or suggest a dimension demultiplexer that generates in-phase and quadrature components that are encoded based on a space time block code and an outer code

As best understood by Applicants, Onggosanusi discloses a receiver 104 that includes space time block coded transmit antenna diversity (STTD) decoders 110 and a channel decoder 40". The STTD decoders 110 are used to decode a space time block coded signal. The channel decoder 40" is used to decode an outer encoded signal. The space time block decoding of Onggosanusi is performed before the outer decoding. Thus, Onggosanusi does not disclose joint decoding.

As best understood by Applicants, Fang discloses a circuit that simply performs outer decoding. Fang does not disclose inner decoding, space time block decoding, or joint decoding.

Thus, because Onggosanusi and Fang do not disclose joint decoding, Onggosanusi and Fang also do not disclose a dimension demultiplexer that generates in-phase and quadrature components that are encoded based on a space time block code and an outer code. The dimension demultiplexer generates the in-phase and quadrature components to begin a joint decoding process.

In the disclosed embodiments of the present application, joint decoding is performed, for example, by a branch metric computation module 40 and a Viterbi decoder 42. In-phase and quadrature components, that are encoded based on a space time block code and an outer code, are received by the branch metric computation module 40 from a dimension demultiplexer. The branch metric computation module 40 generates single dimensional branch metrics based respectively on each of the in-

phase and quadrature components. The Viterbi decoder 42 determines a most likely received sequence based on the single dimensional branch metrics.

The dimension demultiplexer of Claim 1 separates a demodulated symbol sequence to begin the joint decoding of each of the in-phase and quadrature components. The dimension demultiplexer is used to simplify the computations involved in decoding a signal that is encoded based on a space time block code that is in concatenation with an outer code. The separation of the demodulated symbol sequence into in-phase and quadrature components allows a branch metric computation module to generate single dimensional metrics. This reduces the computation complexity involved in the decoding process performed by, for example, a Viterbi decoder. See paragraph [0033] of the present application.

Onggosanusi does not disclose the claimed dimension demultiplexer, as admitted to by the Examiner. The Examiner alleges that Fang discloses a demultiplexer that provides I and Q components. Applicants submit that Fang discloses a demodulator 10 that generates I and Q symbols based on a received signal that appears to be encoded based solely on an outer code. Thus, Fang does not disclose a demultiplexer that receives a demodulated signal that is encoded based on a space time block code and an outer code. Accordingly, Fang also does not disclose a demultiplexer that generates in-phase and quadrature components that are encoded based on a space time block code and an outer code.

Also, since Onggosanusi and Fang do not disclose the claimed dimension demultiplexer, Onggosanusi and Fang do not show, teach or suggest the claimed

branch metric computation module that generates branch metrics based on the output from the dimension demultiplexer.

It is a longstanding rule that to establish a prima facie case of obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 143 (CCPA 1974), see MPEP §2143.03.

Therefore, Claim 1 is allowable for at the above reasons. Claims 35 and 61 are allowable for at least similar reasons. Claims 2-8, 10-16, 36-46, 62-72, 84-94 and 96 ultimately depend from Claims 1, 35 and 61 and are allowable for at least the same reasons.

With respect to Claim 17, Onggosanusi and Fang do not at least show teach or suggest a branch metric computation module that generates branch metrics based on separated in-phase and quadrature components that are encoded based on a space time block code and an outer code.

Onggosanusi does not appear to disclose a branch metric computation module, as admitted to by the Examiner. The Examiner alleges that Fang discloses a branch metric computation module. As best understood by Applicants, Fang discloses a branch metric computation module 16 that generates branch metrics based on I and Q signals, which appear to be encoded based solely on an outer code. Fang does not disclose a branch metric calculation module that generates branch metrics based on I and Q signals that are encoded based on a space time block code. Thus, Onggosanusi and Fang fail to disclose each and every limitation of Claim 17.

Therefore, Claim 17 is allowable is allowable for at the above reasons. Claims 47 and 73 are allowable for at least similar reasons. Claims 18-34, 48-60, 72-88 and 95 ultimately depend from Claims 17, 47 and 73 and are allowable for at least the same reasons.

ALLOWABLE SUBJECT MATTER

The Examiner states that claims 92-94 would be allowable if rewritten in independent form. Claims 92-94 ultimately depend from Claim 1 and are allowable as drafted for at least the same reasons. Applicants reserve the right to amend Claims 92-94 into their originally allowable form at a later date if needed.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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